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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/497,515	02/04/2000	Shuji Hitomi	Q57834	7579

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Sughrue Mion Zinn MacPeak & Seas PLLC  
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EXAMINER

MERCADO, JULIAN A

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 02/14/2002

7

Please find below and/or attached an Office communication concerning this application or proceeding.

MF-7

**Office Action Summary**

Application No.

09/497,515

Applicant(s)

HITOMI

Examiner

Mercado A Julian

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 November 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 11-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)                      4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)                      5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_                      6) ☐ Other: \_\_\_\_\_

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## **DETAILED ACTION**

### ***Remarks***

This Office Action is responsive to Applicant's amendment filed November 1, 2001.

Applicant's election without traverse of Group 2, claims 1-10 in Paper No. 6 is acknowledged.

Claims 11-20 are withdrawn from further consideration by the examiner, 37

CFR 1.142(b) as being drawn to a non-elected invention.

### ***Claim Objections***

Claims 1-3, 5 and 9 are objected to because of the following informalities:

- a. In claim 1 at line 2, it is suggested to change "containing" to --contains--.
- b. In claim 2 at line 2, it is suggested to change "porous" to --pores--.
- c. In claim 3 at line 2, it is suggested to change "and" after "layer" to a comma -- , --.
- d. In claim 3 at line 5, it is suggested to change "containing" to --contains--.
- e. In claim 5 at line 1, it is suggested to change "wherin" to --wherein--.
- f. In claim 9 at line 2, it is suggested to insert --within-- after "is".

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

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The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 5 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 5 recites that the porous polymer has “no” ion-exchange function. The examiner notes that the specification has only disclosed a polymer which “does not always” have proton conductivity. (emphasis added, see page 12 line 12 *et seq*) Thus, the degree to which the claimed porous polymer has an ion-exchange function (or lack thereof) does not appear to be commensurate in scope with that disclosed in the specification. The examiner also questions the operability of an electrode and fuel cell if a porous polymer employed therein has no ion-exchange function. Without ion, e.g. proton flow, catalytic reaction at the anode would not occur, and thus concomitant electron production as an electrical current would be stagnated.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2, 4, and 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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Claim 2 recites the limitation "the inside portion" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 4 at line 2 and line 3 (both instances) recites a similar limitation to claim 2 above and is thus rejected under the same grounds.

Claim 6 recites the limitation "the three-dimensional network structure" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7, 9 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Mussell *et al* (U.S. Pat. 5,620,807).

Mussell teaches a solid polymer electrolyte having a catalyst layer [1], a porous polymer [4], and a gas diffusion layer [5]. ~~The catalyst layer is specifically~~ disclosed as either a discrete layer [2] or incorporated into the membrane itself. (Col. 2 line 36 *et seq*) The porous polymer is shown in Figure 1 provided at the surface of the catalyst layer in that both surfaces are at a mutual interface. The porous polymer is specifically disclosed as a fluorocarbon polymer. (Col. 3 line 43 *et seq*) To the extent that claim 6 is understood by the examiner for the reasons

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discussed under 35 U.S.C. 112, first paragraph (discussion above), since the fluorocarbon polymer disclosed by Mussell is the same as that claimed by Applicant, the fluorocarbon polymer is considered to be a polymer which does not or does not always have proton conductivity. Pores within the polymer would naturally flow to have a three-dimensional structure. The mean or average diameter of the pores is specifically disclosed at less than 1  $\mu\text{m}$ . (Col. Line 42) The porosity of the polymer is specifically disclosed within the range of 45 to 95%. (Col. 5 line 67)

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mussell *et al* as applied to claims 1-7, 9 and 10 above.

The teachings of Mussell are discussed above.

Mussell does not explicitly teach an average pore diameter of 0.05  $\mu\text{m}$ . However, absent of unexpected results, it would have been obvious to one of ordinary skill in the art to employ a lower average pore diameter than that explicitly disclosed by Mussell, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering optimum or workable ranges for a result-effective variable involves only routine skill in the art. *In re Aller*,

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105 USPQ 233. Mussell discloses pore diameters as result-effective in that its optimum size directly correlates with the current density and desired power output. (Col. 5 lines 17-30) Further, as discussed above, Mussell specifically discloses a mean or average diameter of the pores at less than 1  $\mu\text{m}$ . Thus, while Mussell expresses a preference for pores of 1  $\mu\text{m}$  or less, at the same time Mussell provides the motivation for the skilled artisan to focus on pore diameters at the bottom of Mussell's suitable range of 1  $\mu\text{m}$  or less and further explore pore diameters below that range.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Pat. 4,876,115 to Raistrick is an exemplary teaching of a SPE fuel cell electrode assembly having catalytic and polymeric layers, and U.S. Pat. 5,783,325 to Cabasso *et al* teaches fluorocarbon polymers in a fuel cell electrode assembly.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julian A. Mercado whose telephone number is (703) 305-0511.

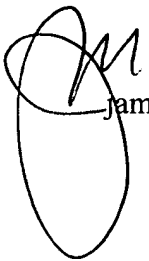
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gabrielle Brouillette, can be reached at (703) 308-0756. The official fax phone number for the organization where this application or proceeding is assigned is (703) 305-3599. The unofficial fax number is (703) 306-3429.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

A handwritten signature, possibly reading "M", enclosed within a large, hand-drawn oval.

Jan/January 27, 2002

A large, stylized handwritten signature, likely belonging to Stephen Kalafut.

STEPHEN KALAFUT  
PRIMARY EXAMINER  
GROUP 700